



An Approach for Generating Precipitation Input for Worst-Case Flood Modelling

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There is a lack of suitable methods for creating precipitation scenarios that can be used to realistically estimate peak discharges with very low probabilities. On the one hand, existing methods are methodically questionable when it comes to physical system boundaries. On the other hand, the spatio-temporal representativeness of precipitation patterns as system input is limited.

In response, this study proposes a method of deriving representative spatio-temporal precipitation patterns and presents a step towards making methodically correct estimations of infrequent floods by using a worst-case approach. A Monte-Carlo rainfall-runoff model allows for the testing of a wide range of different spatio-temporal distributions of an extreme precipitation event and therefore for the generation of a hydrograph for each of these distributions. Out of these numerous hydrographs and their corresponding peak discharges, the worst-case catchment reactions on the system input can be derived. The spatio-temporal distributions leading to the highest peak discharges are identified and can eventually be used for further investigations.